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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/790,969   | 03/01/2004  | Yam Mo Wong          | P/4076 - 71         | 2110             |
| 2352   | 7590        | 08/09/2005           | EXAMINER            |                  |
| OSTROLENK FABER GERB & SOFFEN<br>1180 AVENUE OF THE AMERICAS<br>NEW YORK, NY 100368403 |             |                      | CAO, PHAT X         |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2814                |                  |

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

|                              |                               |                             |  |
|------------------------------|-------------------------------|-----------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/790,969 | Applicant(s)<br>WONG ET AL. |  |
|                              | Examiner<br>Phat X. Cao       | Art Unit<br>2814            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.  
 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
     4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-4, 7-9 and 12 is/are rejected.  
 7) ☒ Claim(s) 5, 6, 10 and 11 is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Group I (claims 1-12) in the reply filed on 6/22/05 is acknowledged. The traversal is on the ground(s) that "The Examiner's proposed alternative method excludes the formation of the second ball on the connection pad". This is not found persuasive because the alternative method proposed by the examiner does include the formation of the second ball on the connection pad. Specifically, the restriction requirement mailed June 1, 2005 clearly states that "Instead of forming a first bump ball on the connection pad **and then** forming a second bump ball on the connection pad, an alternative method can be used by first forming a second bump ball on a first bump ball **and then forming them together on a connection.**" Therefore, a phrase "forming them together on a connection pad" does include the formation of the second ball on the connection pad.

Applicant also traverses on the ground that the alternative method proposed by the examiner is not practical. This is also not persuasive because Applicant has not provided the evidences to convince that the alternative proposed by the examiner would not be suitable in producing the recited device. It is submitted that the materially different processes would be suitable. The Patent Office is not in a position to demonstrate the effectiveness of the materially different process. Finally, the search is not coextensive as evidenced by the different fields of search for the process and product as cited in the restriction requirement mailed on 6/1/2005.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Young et al (US. 6,429,028).

Regarding claims 1-2, Young (Fig. 2C) discloses a method of forming a wire bond bonding a wire 32 to a connection pad 22 of an electronic device 20 comprising the steps of: forming a first bump ball 24 on the connection pad 22; forming a second bump ball 30 on the connection pad 22 that is contiguous with the first bump ball 24; and the wire 32 extending from the second bump ball 30.

Regarding claim 4, Young (Figs. 2A-2B) further discloses that the wire 26 is severed from the first bump ball 24 (also see column 7, lines 22-28) prior to form the second bump ball 30.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 4, and 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsumoto et al (US. 6,583,483).

Regarding claims 1 and 7, Matsumoto (Fig. 4) discloses a method of forming a wire bond bonding a wire to a connection pad 20a of an electronic device 14 comprising the steps of: forming a first bump ball 26 on the connection pad 20a; forming a second bump ball 26b on the connection pad 20a that is contiguous with the first bump ball 26; and forming an additional bump 52 that is contiguous with the second bump ball 26b.

Regarding claims 4 and 8-9, Matsumoto further discloses that the wire 22a (see Fig. 2) is extended from the additional bump ball 52, the wire is severed from the first bump ball 26 prior to form the second bump ball 26b (see Fig. 4 and column 5, lines 43-51), and the wire is also severed from the second bump 26b prior to form the additional bump 52 (also see Fig. 4 and column 5, lines 43-51).

6. Claims 1-3 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Shibata (US. 6,864,587).

Regarding claim 1, Shibata (Fig. 15B) discloses a method of forming a wire bond

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bonding a wire (see Fig. 1) to a connection pad 5d of an electronic device 2 comprising the steps of: forming a first bump ball 15d on the connection pad 5d; and then forming a second bump ball 15e on the connection pad 5d that is contiguous with the first bump ball 15d.

Regarding claims 2 and 3, Shibata further discloses that the wire 6 (see Fig. 1) extends from the second bump ball, and the second bump ball 15e (see Fig. 15B) partially lies on the connection pad 5d and partially lies on the first bump 15d.

Regarding claim 7, Shibata further discloses the step of forming an additional bump 15c that is contiguous with the second bump ball 15e.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al (US. 6,583,483).

Matsumoto (Fig. 2) does not disclose that the wire 22 has the diameter of less than 50 um.

However, it has been held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to form the wire 22 of Matsumoto with the

diameter range as claimed because the diameter of the conductive wire can be optimized during routine experimentation depending upon the conductivity or resistance which is desired for the conductive wire.

***Allowable Subject Matter***

8. Claims 5-6 and 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to disclose edging the first bump ball and forming a recessed portion in the bump ball prior to forming the second bump ball.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is 571-272-1703. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PC  
August 4, 2005

  
PHAT X. CAO  
PRIMARY EXAMINER